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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/212,726	12/15/1998	KLAUS F. SCHUEGRAF	M122-1098	7984

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EXAMINER
KIELIN, ERIK J

ART UNIT	PAPER NUMBER
2813	26

DATE MAILED: 04/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/212,726	Applicant(s) SCHUEGRAF, KLAUS F.	
	Examiner Erik Kielin	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *60-64 and 66-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *60-64 and 66-70* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3 April 2003 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 69 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not provide enablement for depositing SiO_2 at a deposition rate of 7000 Å/min at a temperature of 640 °C to 900 °C. Rather the specification only provides for these deposition rates for the 400 °C LPCVD cold-wall system. (See instant specification, p. 11.)

4. Claims 60-64, and 66-70 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Regarding independent claim 60, the specific combination of conditions while using cold-wall LPCVD as indicated in the specification

on p. 11 for achieving the resulting deposition rate of 7000 Å/min critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). See the instant specification at p. 11, which indicates that the deposition rate is the result of using the specified conditions --not any conditions at all.

The remaining claims are rejected for depending from the above rejected claims.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 60-64, 66-68, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,710,079 (**Sukharev**) in view of US 5,314,724 (**Tsukune** et al.).

Regarding claim 60, **Sukharev** discloses a semiconductor processing method of depositing a SiO_2 layer comprising,

providing a substrate **101** within a chemical vapor deposition (CVD) reactor **300** (Figs. 1 and 3);

feeding a gaseous silicon precursor into the CVD reactor (col. 3, lines 50-65);

feeding gaseous H_2O_2 into the CVD reactor (col. 3, lines 50-65); and

utilizing the silicon precursor, depositing a layer of SiO_2 over a surface of the substrate at a rate of 7000 Å per minute (col. 3, lines 50-65).

Sukharev does not indicate that the deposition rate is about 7000 Å/min.

Tsukune discloses a CVD method of depositing a SiO_2 layer wherein the deposition rate is taught in one exemplary embodiment to be 7000 Å/min.
It would have been obvious for one of ordinary skill in the art, at the time of the invention to apply the deposition rate of **Tsukune** to that of **Sukharev** because **Tsukune** teaches that the deposition rate is common in the art. Moreover, the instant specification provides no indication that the deposition rate has anything to do with the object of (criticality of) the instant invention which, as indicated in the instant specification at page 4 is to prevent the formation of undesired reaction intermediates in the decomposition of the CVD precursor gases.

Regarding claim 61, **Sukharev** discloses that the gaseous precursors are independently fed into the CVD reactor (Fig. 2).

Regarding claim 62, **Sukharev** discloses that the precursors are necessarily fed into the CVD reactor simultaneously (col. 3, lines 55-59).

Regarding claim 63, **Sukharev** discloses that the gaseous H_2O_2 and the gaseous silicon precursor are comprised by a gaseous mixture that is fed into the chemical vapor deposition reactor (col. 3, lines 55-59).

Regarding claim 64, **Sukharev** discloses that gaseous H_2O is also fed into the CVD reactor (col. 3, lines 55-59).

Regarding claim 66, **Sukharev** shoes that the substrate **101** is shown to have a high aspect ratio and that the SiO_2 is conformally deposited, by definition, since the SiO_2 film "conforms" to the surface (Fig. 1).

Regarding claim 67, **Sukharev** discloses that the gaseous precursor may be at least TEOS (col. 3, lines 55-59).

Regarding claim 68, **Sukharev** discloses that the deposition temperature is preferably 400 °C (col. 6, lines 24-27).

Regarding claim 70, the prior art as explained above discloses all of the limitations of the instant invention, but does not teach the claimed concentration range of 5-15% H_2O_2. Instead, **Sukharev** discloses ranges of 0.5 to 3% H_2O and 0-3% H_2O_2. However, it has been held that choosing parameters within or near ranges taught by the prior art is *prima facie* obvious. See *In re Wertheim,* 541 F.2d 257, 191 USPQ 90 (CCPA 1976). See also *In re Huang*, 40 USPQ2d 1685, 1688(Fed. Cir. 1996)(claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). Therefore, it would have been obvious to choose a concentration with 5% and 15% because **Sukharev** discloses a range near the claimed range, according to the precedent set by *In re Wertheim or In re Huang*. Moreover, the concentration range for H_2O and/or H_2O_2 indicated in the specification to provide conditions "which are effective to reduce formation of undesired reaction intermediates" --the object of the invention-- range from less than 0.5% to 50% (see specification page 12, lines 3-13) and overlap those in **Sukharev**, e.g. 0.5 to 3% H_2O and 0-3% H_2O_2. Accordingly, there is nothing critical to the range now claimed in instant claim 69.

7. Claim 69 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sukharev** in view of **Tsukune** as applied to claim 60 above, and further in view of **Wolf**, et al.

Silicon Processing for the VLSI Era, Vol. 1-Process Technology, Lattice Press: Sunset Beach CA, 1986, p. 194.

The prior art of **Sukharev** in view of **Tsukune**, as explained above, discloses each of the claimed features except for indicating a temperature of 640 °C to 900 °C to dependent the SiO_2.

Wolf teaches that typical CVD temperatures for deposition using TEOS as **Sukharev** is are from 650 °C to 750 °C to give a conformal coating.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use the well-known temperature of range of 650 °C to 750 °C, as taught by **Wolf**, as the deposition temperature in **Sukharev** because it appears that the temperature would work just as well as the exemplary temperature range given in **Sukharev** and is a known temperature for deposition. Additionally, one of ordinary skill would be motivated to use the higher temperature to increase the deposition rate and thereby increase throughput. Moreover, it is clear from the instant specification that the deposition temperature is not critical to achieving the object of the invention. Instead, it is indicated to be the presence of H_2O and/or H_2O_2.

Response to Arguments

8. Applicant's arguments with respect to claims 60-64 and 65-67 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 703-306-5980. The examiner can normally be reached on 9:00 - 19:30 on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Erik Kielin
April 26, 2003